

	L #	Search Text	Hits
5	L35	"SEARCH OF MOST RELEVANT US & IPC CLASS + AN +IDS.:" 31 32 "271"/\$.ccls. B65H\$/\$.ipc.	2871 61
6	L36	"REQUIRED SEARCH OF US CLASS/SUBCLASS + AN +IDS.:" 31 32 "Rotary Separators.:" 271/109.ccls. "Variably or intermittently driven.:" 271/114.ccls. "In oscillatory movement.:" 271/115.ccls. "by overrunning one way drive.:" 271/116.ccls. "additional movement (e.g., rotation or oscillation) about its own axis.:" 271/95.ccls. "With means to restrain feed of next sheet.:" 271/121.ccls. "By restrainer having rearwardly moving surface.:" 271/122.ccls. "Including restraining roller.:" 271/125.ccls. "By endless-band or rotating (e.g., feed-roller) member.:" 400/629.ccls. "With means to restrain feed of next sheet.:" 271/167.ccls. B65H003/34.ipc. B65H003/06.ipc. B65H003/52.ipc. B65H003/12.ipc.	1812 7
7	L37	"APPLICANT(S) NAME(S).:" (miki near4 katsuhiko).in.	93
8	L38	"ASSIGNEE(S) NAME(S).:" (ricoh).as.	2154 94

	DBs
5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
8	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB

	L #	Search Text	Hits
9	L39	37 and 36	27
10	L40	38 and 36	2134
11	L41	"REQUIRED SEARCH OF US CLASS/SUBCLASS + AN +IDS.:" 31 32 "Rotary Separators.:" 271/109.ccls. "Variably or intermittently driven.:" 271/114.ccls. "In oscillatory movement.:" 271/115.ccls. "by overrunning one way drive.:" 271/116.ccls. "additional movement (e.g., rotation or oscillation) about its own axis.:" 271/95.ccls. "With means to restrain feed of next sheet.:" 271/121.ccls. "By restrainer having rearwardly moving surface.:" 271/122.ccls. "Including restraining roller.:" 271/125.ccls. "By endless-band or rotating (e.g., feed-roller) member.:" 400/629.ccls. "With means to restrain feed of next sheet.:" 271/167.ccls.	3923
12	L42	38 and 41	306

	<b>DBs</b>
<b>9</b>	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB
<b>10</b>	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB
<b>11</b>	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
<b>12</b>	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB

	L #	Search Text	Hits
13	L43	"INVENTORS APPROACH to PROBLEM - WORD/SYNONYM SEARCH.:" (oscillate oscillation oscillating oscillated oscillates oscillator oscillatory reciprocate reciprocating reciprocated reciprocates reciprocation shake shaking shaken shakes shook shakable vibrate vibrator vibrators vibrating vibrated vibration vibrations vibratory cycle cycles cycling cycle cyclic cyclically frequencies frequency sinusoid sinusoids sinusoical) with (bias biased biasing biases force forced forcing forces press pressing pressed presses push pushes pusher pushing pushed pressure resilient resiliency resiliently thrust thrusting thrusts thrusted urge urging urged urges)	4658 13
14	L44	43 and 41	224
15	L46	(torque)	4084 68

	DBs
13	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
14	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB

	L #	Search Text	Hits
16	L47	"INVENTORS APPROACH to PROBLEM - WORD/SYNONYM SEARCH.:" (oscillate oscillation oscillating oscillated oscillates oscillator oscillatory reciprocate reciprocating reciprocated reciprocates reciprocation shake shaking shaken shakes shook shakable vibrate vibrator vibrators vibrating vibrated vibration vibrations vibratory cycle cycles cycling cycle cyclic cyclically frequencies frequency sinusoid sinusoids sinusoical) with (bias biased biasing biases force forced forcing forces press pressing pressed presses push pushes pusher pushing pushed pressure resilient resiliency resiliently thrust thrusting thrusts thrusted urge urging urged urges) same torque	1114 9
17	L48	47 and 36	24

	DBs
16	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
17	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB



	L #	Search Text	Hits
1	L31	"APPLICATION No. (AN):" 10/653,997	1
2	L32	"APPLICANT CITED INFORMATION (IDS):" "4573675".pn.	2
3	L33	"SEARCH OF RELEVANT PRODUCT DESCRIPTIONS + AN + IDS:" 31 32 (ATM "automated teller machine" "bill changer" cashbox "cash dispenser" "check sorter" "check sorting" "check cancellation" "check adj canceling" "currency acceptor" "currency dispenser" copier copiers copying duplicator duplicators duplicating electrophotographic electrophotography electrostatographic electrostatography facsimile fax "image forming" "paper handling" "paper processing" payout photocopier photocopying photocopied printer printers printing "reproduction apparatus" "reproduction machine" "reproduction device" scanner scanners scanning " sheet handling" "sheet processing" typewriter typewriters typewriting xerographic xerography)	2105 235
4	L34	"SEARCH OF RELEVANT US & IPC CLASSES + AN + IDS:" 31 32 "sheet handling:." "271"/\$.ccls. "ink jet:." "347"/\$.ccls. "fax:." "358"/\$.ccls. "cryptography:." "380"/\$.ccls. "copiers:." "399"/\$.ccls. "typewriters:." "400"/\$.ccls. "money handling :." "902"/\$.ccls. B65H\$/\$.ipc.	5219 45

	<b>DBs</b>
<b>1</b>	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
<b>2</b>	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
<b>3</b>	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB
<b>4</b>	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB

# **SHEET FEEDING METHOD AND DEVICE AND IMAGE FORMING APPARATUS USING THE DEVICE**

## **CROSS REFERENCE TO RELATED APPLICATIONS**

This application is related to and claims priority, under 35 U.S.C. §119, from Japanese Patent Application Nos. 2000-158235 and No. 2001-117737, filed in the Japanese Patent Office on May 29, 2000 and April 17, 2001, respectively, and the entire contents of both Japanese patent applications are hereby incorporated by reference herein.

## **BACKGROUND OF THE INVENTION**

### **Field of the Invention**

The present invention relates to a sheet feeding method and a sheet feeding device for image forming apparatuses, such as copying machines, printers, facsimile apparatuses, and printing apparatuses, and also relates to an image forming apparatus using the sheet feeding device.

### **Discussion of the Background**

In image forming apparatuses, such as copying machines, printers, facsimile apparatuses, and printing apparatuses, sheets to be printed on are stacked in a sheet feeding part of the apparatuses and are separated one by one by a sheet feeding device of the apparatuses so as to be fed to an image forming part of the apparatuses. Known sheet feeding devices include feed and reverse rollers (FRR) type device, a friction roller (FR) type device, and a friction pad (FP) type device.

Recently, with the increase the use of color images, a coated sheet having a superior smoothness has been widely used for sheets to be printed on in image forming apparatuses for obtaining a better image quality. The coated sheets tend to closely contact each other, either because of the smoothness of their surfaces or under the influence of humidity, in a sheet feeding part of image forming apparatuses, and thereby incomplete separation of the sheets occurs, resulting in double feeding of the sheets.

The following proposals are known with respect to improvement of sheet separation performance of sheet feeding devices of image forming apparatuses:

a) Japanese Patent Laid-Open Publication No. 5-201571 relates to a sheet feeding device which includes a feed roller rotating at a constant position and a separation member